

**What is claimed is:**

- 1           1.     A method of monitoring language understanding of a user's input  
2 communication in an automated dialog system, comprising:  
3                 determining whether a probability of understanding the user's input  
4 communication exceeds a first threshold, wherein if the first threshold is  
5 exceeded, further dialog is conducted with the user.
- 1           2.     The method of claim 1, wherein if the first threshold is not  
2 exceeded, the user is routed to a human for assistance.
- 1           3.     The method of claim 1, further comprising:  
2                 determining whether a probability of understanding the user's input  
3 communication exceeds a second threshold, the second threshold being greater  
4 than the first threshold, wherein if the second threshold is exceeded, further  
5 dialog is conducted with the user using a current dialog strategy.
- 1           4.     The method of claim 3, wherein if the second threshold is not  
2 exceeded, further dialog is conducted with the user using an adapted dialog  
3 strategy.
- 1           5.     The method of claim 4, wherein the adapted dialog strategy  
2 includes one of prompting the user with choices and prompting the user to  
3 confirm the recognition and understanding data.
- 1           6.     The method of claim 1, wherein the user's input communication  
2 includes at least one of verbal and nonverbal communications.
- 1           7.     The method of claim 6, wherein the nonverbal communications  
2 include at least one of gestures, body movements, head movements, non-  
3 responses, text, keyboard entries, keypad entries, mouse clicks, DTMF codes,  
4 pointers, stylus, cable set-top box entries, graphical user interface entries, and  
5 touchscreen entries.
- 1           8.     The method of claim 1, wherein the method is used for customer  
2 care purposes.
- 1           9.     The method of claim 1, wherein the probability is determined using  
2 recognition and understanding data derived from the user's input communication.

1           10.    The method of claim 1, wherein the probability is determined using  
2 training data stored in a training database, the training data including at least one  
3 of classification models and extracted features.

1           11.    The method of claim 10, wherein the extracted features are derived  
2 from recognition, understanding and dialog data.

1           12.    The method of claim 1, further comprising:  
2                   storing a first dialog exchange in a dialog history database, wherein  
3 the first dialog exchange includes a first automated dialog output and the user's  
4 first input communication and the further dialog conducted with the user results in  
5 a second dialog exchange, wherein the second dialog exchange includes a  
6 second dialog output and the user's second input communication; and  
7                   determining whether the probability of understanding exceeds the  
8 first threshold using the first dialog exchange and the second dialog exchange.

1           13.    The method of claim 12, wherein the method is recursive in that the  
2 determining step determines whether the probability of exceeds the first  
3 threshold using the each of the dialog exchanges conducted.

1           14.    The method of claim 1, further comprising:  
2                   receiving the user's input communication;  
3                   recognizing portions of the user's input communication; and  
4                   providing an input to a language understanding monitor based on  
5 applying a confidence function to the recognized portions of the user's input  
6 communication.

1           15.    A language understanding monitoring system that operates in an  
2 automated dialog system, comprising:  
3                   a dialog manager that output dialog to the user;  
4                   a language understanding monitor that determines whether a  
5 probability of understanding the user's input communication exceeds a first  
6 threshold, wherein if the first threshold is exceeded, the language understanding  
7 monitor prompts the dialog manager to conduct further dialog with the user.

1           16.    The system of claim 15, wherein if the first threshold is not  
2   exceeded, the language understanding monitor prompts the dialog manager to  
3   route the user to a human for assistance.

1           17.    The system of claim 15, wherein the language understanding  
2   monitor determines whether a probability of understanding the user's input  
3   communication exceeds a second threshold, the second threshold being greater  
4   than the first threshold, and if the second threshold is exceeded, the language  
5   understanding monitor prompts the dialog manager to conduct further dialog with  
6   the user using a current dialog strategy.

1           18.    The system of claim 17, wherein if the second threshold is not  
2   exceeded, the language understanding monitor prompts the dialog manager to  
3   conduct further dialog with the user using an adapted dialog strategy.

1           19.    The system of claim 18, wherein the adapted dialog strategy  
2   includes one of prompting the user with choices and prompting the user to  
3   confirm the recognition and understanding data.

1           20.    The system of claim 15, wherein the user's input communication  
2   includes at least one of verbal and nonverbal communications.

1           21.    The system of claim 15, wherein the system is used for customer  
2   care purposes.

1           22.    The system of claim 15, wherein the language understanding  
2   monitor determines the probability using recognition data provided by a  
3   recognizer and understanding data provided by a language understanding unit,  
4   and the recognition and understanding data is derived from the user's input  
5   communication.

1           23.    The system of claim 15, further comprising a training database for  
2   storing training data for language understanding, wherein the language  
3   understanding monitor determines the probability using the training data stored in  
4   the training database, the training data including at least one of classification  
5   models and extracted features.

1           24.    The system of claim 23, wherein the extracted features are derived  
2   from recognition, understanding and dialog data.

1           25.    The system of claim 15, further comprising:  
 2                   a dialog history database that stores a first dialog exchange,  
 3 wherein the first dialog exchange includes a first automated dialog output and the  
 4 user's first input communication, and the further dialog conducted with the user  
 5 results in a second dialog exchange, the second dialog exchange including a  
 6 second dialog output and the user's second input communication, and the  
 7 language understanding monitor determining whether the probability of  
 8 understanding exceeds the first threshold using the first dialog exchange and the  
 9 second dialog exchange.

1           26.    The system of claim 25, wherein the language understanding  
 2 monitor determines whether the probability of understanding exceeds the first  
 3 threshold using the each of the dialog exchanges conducted.

1           27.    The system of claim 15, further comprising:  
 2                   a recognizer that recognizes the user's input communication; and  
 3                   a language understanding unit that applies a confidence function to  
 4 the recognized portions of the user's input communication and provides an input  
 5 to the language understanding monitor.

1           28.    A method of monitoring language understanding of a user's input  
 2 communication in an automated dialog system, comprising:  
 3                   determining whether a probability of understanding the user's input  
 4 communication exceeds a first threshold, wherein if the first threshold is  
 5 exceeded, further dialog is conducted with the user, otherwise, the user is routed  
 6 to a human for assistance;  
 7                   determining whether a probability of understanding the user's input  
 8 communication exceeds a second threshold, the second threshold being greater  
 9 than the first threshold, wherein if the second threshold is exceeded, further  
 10 dialog is conducted with the user using a current dialog strategy, otherwise  
 11 further dialog is conducted with the user using an adapted dialog strategy.